

Claims

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- [c1] A system for noise reduction from an air-moving device, comprising:
a shroud having an inner surface disposed around an area defining an airflow;
at least one outer barrel connected to the shroud, the outer barrel having an inner and outer surface extending from the shroud inner surface further defining the airflow; and
at least one noise silencer comprising at least one hollow cavity tuned to attenuate predetermined noise frequency ranges within the airflow, the noise silencer connected to the airflow by at least one opening of a predetermined size through the outer barrel.
- [c2] The system of claim 1 wherein the noise silencers are attached to the outer barrel outer surface.
- [c3] The system of claim 1 wherein the noise silencers are attached to the shroud.
- [c4] The system of claim 1 further comprising stator members attached on the barrel inner surface.
- [c5] The system of claim 1 wherein the barrel extends downstream of the air-moving device.
- [c6] The system of claim 1 wherein the barrel extends upstream of the air-moving device.
- [c7] The system of claim 1 wherein the barrel extends upstream and downstream of the air-moving device.
- [c8] The system of claim 1 wherein the noise silencer is a Helmholtz resonator.
- [c9] The system of claim 1 wherein the noise silencer is a broadband silencer.
- [c10] The system of claim 1 wherein the noise silencer is a narrowband silencer.
- [c11] The system of claim 1 comprising a plurality of noise silencers for both narrowband and broadband application.
- [c12] The system of claim 1 comprising a plurality of noise silencers arranged in a

parallel configuration.

[c13] The system of claim 1 comprising a plurality of noise silencers arranged in a series configuration.

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[c14] The system of claim 1 wherein the air-moving devices are a plurality of the axial flow fans with corresponding plurality of outer barrels configured to be disposed around the air-moving device airflow.

[c15] The system of claim 1 wherein the noise silencer cavity further comprises a sound absorbing material.

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[c16] The system of claim 15 wherein the sound absorbing material is steel wool.

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[c17] The system of claim 1 further comprising an inner barrel with at least one noise silencer attached to the air-moving device.

[c18] The system of claim 1 wherein the noise silencer further comprises at least one pipe disposed between the opening through the outer barrel and the hollow cavity.

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[c19] A method for reducing noise from an air-moving device, comprising the steps of:
creating an airflow through a shroud and outer barrel;
communicating air from the airflow within the barrel to a cavity with an opening; and
reducing airflow noise by resonating an air plug present in the opening forming a mass that resonates on support of a spring force formed by the air enclosed in the cavity.

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[c20] The method of claim 18 further comprising the step of redirecting the airflow using stator members.

[c21] An article of manufacture for reducing noise from an air-moving device, comprising:
a shroud having an inner surface disposed around an area defining an airflow;
at least one outer barrel connected to the shroud, the outer barrel having an

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inner and outer surface extending from the shroud inner surface further defining the airflow; and
at least one noise silencer comprising at least one hollow cavity tuned to attenuate predetermined noise frequency ranges within the airflow, the noise silencer connected to the airflow by at least one opening of a predetermined size through the outer barrel.

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